Trend Study 28-8-98

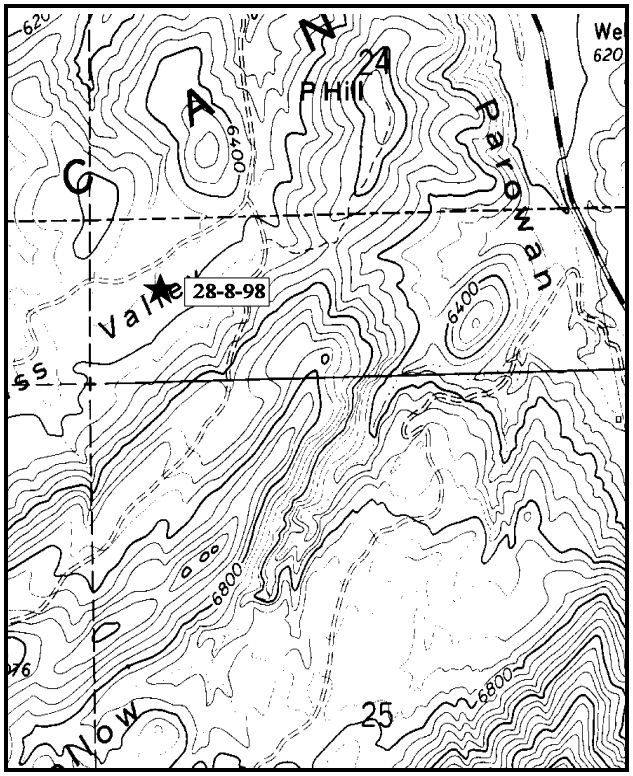
Study site name: Grass Valley . Range type: Big Sagebrush .

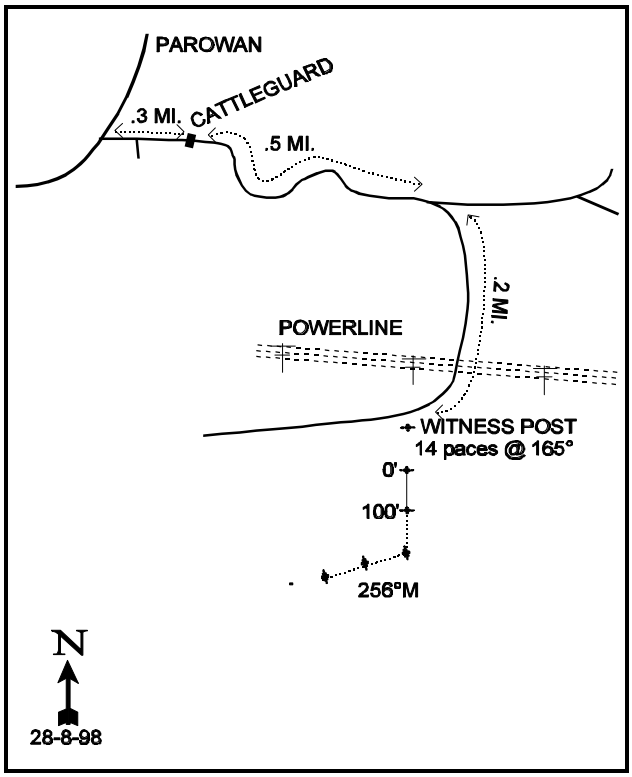
Compass bearing: frequency baseline 165 M degrees, lines 3-4, 256 M degrees.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

From I-15 take the north Parowan exit south into town. Continue down Main Street to a big gradual curve on south end of town. Turn east off the highway across from a log house onto a dirt road, go past other houses staying on the main road 0.3 miles to cattleguard. From the cattleguard, continue 0.5 miles to a fork. Bear right. Proceed 0.2 miles, under powerlines to a witness post on left side of the road. The baseline starts 68 feet at a bearing of 165° M, and is marked by 2-foot tall fenceposts with no browse tag. Line-intercept transect 57B-1-78 is located 0.4 miles further down the road.





Map Name: Parowan

Diagrammatic Sketch

Township 34S , Range 9W , Section 24

UTM 4187912.078 N, 339118.518 E

DISCUSSION

Trend Study No. 28-8 (47-8)

The Grass Valley trend study is located in the foothills south of Parowan. Elevation is approximately 6,400 feet with a northeast aspect and gentle 5% slope. The site is surrounded by pinyon-juniper covered hills. Most of the valley was chained and seeded in the mid-1960's by the BLM. The site itself is dominated by Wyoming big sagebrush and seeded grasses and is considered critical deer winter range. A pellet group transect read in conjunction with the vegetative baseline in 1998 showed 61 deer days use/acre, almost 1 elk days use/acre, and 9 cow days use/acre. Approximately three-tenths of a mile west of the site is a three-way exclosure which was built in the late 1970's.

Soil textural analysis indicates a sandy loam with a slightly acidic pH (6.4). The average effective rooting depth (see methods) is almost 16 inches with a layer of rocks encountered between 4 and 8 inches below the soil surface. Chemical analysis measured phosphorus at 9.4 ppm; this low of a value may be limiting to plant development. The soil surface in the shrub interspaces is characterized by bare patches with concentrations of small rocks and pavement that appear to be of volcanic origin. Further erosion does not appear to be a problem on this site for most of the surface soils have been lost many years ago, although some seasonal disturbance is evident.

Wyoming big sagebrush is the dominant browse which had an average cover of nearly 17% in 1992. In 1987, density was estimated to be 5,533 plants/acre with 51% of the sagebrush classified as decadent. Utilization was heavy with 80% of the shrubs displaying heavy hedging. By 1992 with the enlarged sampling design, the sagebrush density was estimated at 4,480 plants/acre. A more critical aspect of the population is that percent decadency increased to 60% with 18% of the decadent shrubs classified as dying. Utilization in 1992 was lighter however, with only 40% of the shrubs being heavily hedged. In 1998, the estimated density declined further down to 3,460 plants/acre. Although percent decadency has improved since 1992, it is still high and data would indicate that plants will continue to die. Currently, 24% of the population is dead.

Pinyon and juniper trees are more prominent as you move south toward the hills. Point-centered quarter data indicates 20 pinyon pine trees/acre and 40 Utah juniper trees/acre in 1998. The only other browse species consisted of a few individuals of threadleaf low rabbitbrush, prickly phlox, and prickly-pear cactus. Bitterbrush and squaw-apple are scattered throughout the site.

Perennial grasses are relatively abundant. Two seeded species, crested wheatgrass and slender wheatgrass, are the most common grasses. Cheatgrass nested frequency has significantly increased since 1992, but cover values have changed very little. Perennial forbs are nearly nonexistent. Total cover contributed by forbs is <1%.

1987 APPARENT TREND ASSESSMENT

Ground cover percentages are typical for this type of site. Litter cover is good and combined with basal vegetation provides almost 60% of the total cover. Pavement and small rocks contribute prominently in the open areas. Exposed soil accounts for 17% of the ground surface and presents an erosion problem only in some of the larger bare areas. Heavy use, high decadency, and low biotic and reproductive potentials are a concern for Wyoming big sagebrush. This population will continue to decline. Grasses are adequately established but forbs are basically absent.

1992 TREND ASSESSMENT

Soil conditions appear stable. Some seasonal erosion is still occurring but it is not serious. Wyoming big sagebrush has declined in density by 19%. It is also showing increased percent decadency. On the positive side, the proportion of plants displaying heavy hedging declined from 80% in 1987 to 40% in 1992. The population appears to be slowly declining with a low biotic and reproductive potential of 12%. Overall browse trend is slightly down. The herbaceous understory consists almost entirely of grasses. Perennial forbs are nearly absent. Combined summed nested frequencies of grasses and forbs (excluding the annuals which were not counted in 1987) have remained basically unchanged since the last reading indicating a stable trend.

TREND ASSESSMENT
soil - stable
browse - slightly down
herbaceous understory - stable, but lacking perennial forbs

1998 TREND ASSESSMENT

The soil trend is slightly up with an increase in vegetation and litter cover. Although percent bare ground cover has slightly increased, the vegetative and litter cover are still adequate to protect the area from extensive runoff. The browse trend is continuing downward, but slower at this time. The population has declined by 23% since 1992. It appears that the population may not be able to sustain itself at current levels. The herbaceous understory trend is slightly upward. Perennial herbaceous species sum of nested frequency has increased slightly since 1992 from 403 to 443. One positive aspect is continued high cover values for crested wheatgrass and slender wheatgrass. These relatively higher cover values will help keep cheatgrass in check. Although cheatgrass nested frequency significantly increased, the cover values stayed nearly the same.

TREND ASSESSMENT
soil - slightly upward
browse - down slightly, the Wyoming big sagebrush population continues to decline, but more slowly at this time
herbaceous understory - slightly upward

HERBACEOUS TRENDS --
Herd unit 28 , Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'92	'98	'87	'92	'98	'92	'98
G	Agropyron cristatum	$_{b}$144	$_{a}$111	$_{ab}$130	62	43	44	6.79	10.10
G	Agropyron intermedium	$_{a}$-	$_{b}$25	$_{b}$11	-	10	6	1.83	.25
G	Agropyron trachycaulum	133	143	111	51	47	39	6.19	4.85
G	Aristida purpurea	-	-	-	-	-	-	-	.15
G	Bromus inermis	21	16	18	10	6	7	.25	.21
G	Bromus tectorum (a)	-	$_{a}$124	$_{b}$194	-	45	72	2.26	2.14
G	Oryzopsis hymenoides	6	9	5	2	3	2	.21	.04
G	Poa bulbosa	$_{a}$-	$_{b}$7	$_{c}$77	-	5	29	.10	1.10
G	Poa secunda	-	4	12	-	3	4	.02	.07
G	Sitanion hystrix	29	46	56	14	22	26	1.90	2.02

Type	Species	Nested Frequency '87	'92	'98	Quadrat Frequency '87	'92	'98	Average Cover % '92	'98
G	Stipa comata	$_{b}$53	$_{ab}$30	$_{a}$13	24	13	6	.69	.72
Total Annual Grasses		0	124	194	0	45	72	2.26	2.14
Total Perennial Grasses		386	515	627	163	197	235	20.27	21.69
F	Alyssum alyssoides (a)	-	-	1	-	-	1	-	.00
F	Astragalus spp.	-	-	4	-	-	2	-	.06
F	Chaenactis douglasii	1	-	2	1	-	2	-	.01
F	Cruciferae	-	9	4	-	3	2	.04	.01
F	Draba spp. (a)	-	-	1	-	-	1	-	.00
F	Eriogonum cernuum (a)	-	6	-	-	3	-	.39	-
F	Microsteris gracilis (a)	-	$_{a}$-	$_{b}$8	-	-	4	-	.02
F	Orobanche fasciculata	-	-	2	-	-	1	-	.00
F	Polygonum douglasii (a)	-	1	4	-	1	2	.00	.01
F	Ranunculus testiculatus (a)	-	$_{a}$-	$_{b}$12	-	-	6	-	.03
F	Taraxacum officinale	-	3	1	-	1	1	.00	.00
F	Unknown forb-annual	-	$_{b}$40	$_{a}$-	-	17	-	.11	-
F	Unknown forb-perennial	1	-	-	1	-	-	-	-
Total Annual Forbs		0	7	26	0	4	14	0.39	0.06
Total Perennial Forbs		2	52	13	2	21	8	0.16	0.09

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 28 , Study no: 8

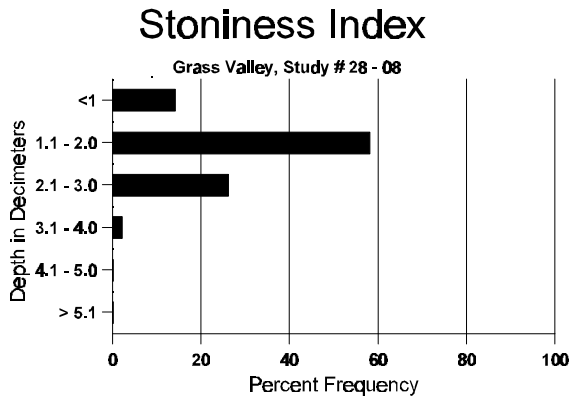
Type	Species	Strip Frequency '92	'98	Average Cover % '92	'98
B	Artemisia tridentata wyomingensis	90	85	16.55	13.69
B	Chrysothamnus viscidiflorus stenophyllus	1	0	.00	-
B	Juniperus osteosperma	0	2	.03	.93
B	Leptodactylon pungens	11	7	.25	.27
B	Opuntia spp.	3	0	-	-
B	Peraphyllum ramosissimum	0	1	-	-
Total for Browse		105	95	16.84	14.90

BASIC COVER --
Herd unit 28 , Study no: 8

Cover Type	Nested Frequency		Average Cover %		
	'92	'98	'87	'92	'98
Vegetation	114	326	4.75	32.46	37.59
Rock	23	130	3.00	1.86	3.20
Pavement	166	285	21.25	23.52	20.40
Litter	257	380	54.25	31.47	48.00
Cryptogams	-	40	0	.16	.47
Bare Ground	154	249	16.75	16.85	21.84

SOIL ANALYSIS DATA --
Herd Unit 28, Study # 08, Study Name: Grass Valley

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
15.9	58.6 (15.6)	6.4	60.7	20.7	18.6	1.7	9.4	192.0	.4



PELLET GROUP FREQUENCY --
Herd unit 28 , Study no: 8

Type	Quadrat Frequency	
	'92	'98
Sheep	-	1
Rabbit	-	48
Deer	-	46
Cattle	-	3

BROWSE CHARACTERISTICS --
Herd unit 28 , Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	92	10	-	-	1	-	-	1	-	-	8	-	4	-	240			12
	98	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	87	-	2	1	-	-	-	-	-	-	3	-	-	-	200			3
	92	6	3	-	6	-	-	-	-	-	14	-	1	-	300			15
	98	9	5	1	1	-	-	-	-	-	16	-	-	-	320			16
M	87	-	10	28	-	-	-	-	-	-	38	-	-	-	2533	20	20	38
	92	11	42	19	2	-	-	-	-	-	74	-	-	-	1480	-	-	74
	98	50	44	4	-	-	-	-	-	-	98	-	-	-	1960	25	35	98
D	87	-	5	37	-	-	-	-	-	-	33	-	3	6	2800			42
	92	16	40	69	2	6	2	-	-	-	97	3	11	24	2700			135
	98	24	32	-	3	-	-	-	-	-	49	-	-	8	1180			59
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	1080			54

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	20%	80%	11%	-19%
'92	41%	40%	16%	-23%
'98	47%	03%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	5533	Dec:		51%
'92	4480			60%
'98	3460			34%

Chrysothamnus viscidiflorus stenophyllus																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'92	20		-
'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	1	-	-	1	-	-	2	-	-	-	40			2
	98	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	57	39	1
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	2	-	-	-	-	-	-	-	-	1	-	-	-	40	-	-	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'92	0		-
	'98	40		-

Leptodactylon pungens																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	28	5	4	1	-	-	-	-	-	36	-	2	-	760	-	-	38
	98	15	-	-	1	-	-	-	-	-	16	-	-	-	320	6	9	16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	11%	09%	04%	-65%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'92	920		-
	'98	320		-

Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'92	60		-
	'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Peraphyllum ramosissimum																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	-	-	1	-	-	-	-	-	-	1	-	-	-	20	25	22	1
D	87	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	100%	00%
'92	00%	00%	00%
'98	00%	100%	00%

Total Plants/Acre (excluding Dead & Seedlings)			%Change	
	'87	133	Dec:	100%
	'92	0		0%
	'98	20		0%